CLAIMS

1. A high speed machining component having a hard material as a base material, and containing at least one element selected from the group consisting of fluorine, chlorine, bromine and iodine, a concentration of the element being in a range of 0.2 mol% to 10 mol% within 1 μm from a surface of the base material.

2. A high speed machining component having a hard material as a base material, having a coating layer containing Ti and C and/or N on an outside of the base material, and containing at least one element selected from the group consisting of fluorine, chlorine, bromine and iodine, a concentration of the element being in a range of 0.2 mol% to 10 mol% within 1 μm from a surface of the coating layer.

3. The component according to claim 2, wherein the coating layer contains one or more members selected from the group consisting of TiC, TiN, TiCN and TiAlCN.

4. The component according to any one of claims 1 to 3, wherein the at least one element selected from the group consisting of fluorine, chlorine, bromine and iodine has been added by ion implantation.

5. The component according to any one of claims 1 to 4, wherein a concentration of Ti is in a range of 0.2 mol% to 80 mol% within 1 μm from a surface of the machining component.

6. The component according to any one of claims 1 to 5,

wherein the base material is a cemented carbide.

7. A high speed machining component produced by bringing the component according to any one of claims 1 to 6 into contact with a workpiece at a speed of 150 m/min or higher.

8. The component according to any one of claims 1 to 6, further having a self-lubricating film on a surface thereof in contact with a workpiece.

9. The component according to claim 8, wherein the self-lubricating film is a film formed by bringing the component into contact with the workpiece at a speed of 150 m/min or higher.

10. The component according to claim 9, wherein the workpiece used for formation of the self-lubricating film contains Ti in a surface layer thereof.

11. The component according to any one of claims 8 to 10, wherein the self-lubricating film contains a Ti oxide and/or a Ti-containing compound oxide; an average valence of Ti in the oxide and/or the compound oxide is greater than 2, but less than 4; and if an amount of Ti in the self-lubricating film is calculated as TiO_2, a mass ratio expressed as (mass of the calculated TiO_2/mass of the self-lubricating film) is 5% or more.

12. A high speed machining method including a step of bringing the component according to any one of claims 1 to 11 into contact with an article at a relative speed of 150 m/min or higher to machine the article.

13. A high speed cutting tool including the component

according to any one of claims 1 to 11.

14. The high speed cutting tool according to claim 13 or 14, wherein a wear width V_B of a tool flank after cutting is performed under conditions including a depth of cut of 1.0 mm, a feed rate of 0.1 mm/rev, a cutting speed of 400 m/min, and a cutting length of 500 m is 70 μm or less.

15. A cutting method including a step of cutting an article by the cutting tool according to claim 13 or 14 at a cutting speed of 150 m/min or higher without use of a cutting oil.

16. A method for producing a high speed machining component, including a step of bringing the component according to any one of claims 1 to 6 into contact with a workpiece at a speed of 150 m/min or higher.